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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/887,021
Filing Date: June 25, 2001
Appellant(s): LEE, TERRY R.

Gianni Minutoli
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/30/2006 appealing from the Office action mailed 06/29/2006

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,658,530	Robertson et al.	12-2003
6,216,205	Chin et al.	04-2001
6,527,587	Ortega et al.	03-2003
6,562,462	Elabd	02-2003

Applicant's Admitted Prior Art in the current application 09/887,021, pages 1-3.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-2, 5-9, 11-12, 14-16, 18-20, 24, 26-27, 29-31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (6,658,530) (hereinafter Robertson) in view of Applicant's Admitted Prior Art (hereinafter AAPA).

As to claim 1, Robertson teaches a circuit card (memory module 100) comprising: a circuit element (e.g. memory chip 107) supported by the circuit card, the circuit element having a plurality of inputs and a plurality of outputs (input/output to signal traces 103) (Figs. 1A, 1B); a plurality of signal lines (103) supported by the circuit card, each signal line being electrically connected respectively to one of said plurality of inputs or one of said plurality of outputs (Fig. 1A and col. 3, lines 47-67); and a plurality of shields (106) (at least col. 3 lines 60-62); wherein said signal lines are grouped in a plurality of adjacent corresponding pairs, a shield being located respectively on each side of each of said plurality of corresponding pairs of said signal lines (Fig. 2B and col. 4, lines 57-67).

Robertson teaches shields located on each side of the signal pair (at ground pins), however, Robertson does not explicitly disclose shields that extend the entire length of the signal to the circuit card and supported by the circuit card. AAPA teaches shields that extend the entire length of the signal to the circuit card and supported by the circuit card (Fig. 3 and paragraph [0008-0009]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement shields that extend the entire length of the signal to the circuit card and supported by the circuit card as taught by AAPA in the system of Robertson to reduce cross-talk along the entire signal lines.

As to claim 2, Robertson further teaches each said shield line is a ground shield (ground) (col. 3, lines 62-67).

As to claim 5, Robertson further teaches the circuit element is a memory device (col. 4, lines 5-21).

As to claims 6, 8, 11, 15, 18, Robertson teaches a circuit card comprising: a plurality of signal lines (103) supported by the circuit card, each signal line being arranged and configured to be electrically connected at a first end respectively to one of a plurality of connectors of a connector device mounted on a printed circuit board (Fig. 1A and col. 3, lines 47-67); a circuit element (e.g. 107 or the interface of 107 where input/output signals go in/out) mounted to the circuit card and having a plurality of inputs and a plurality of outputs (Figs. 1A, 1B), said signal lines being electrically connected at a second end respectively to one of said plurality of inputs or outputs (Fig. 1A and col. 3, lines 47-67); and a plurality of shields (106), the shields being arranged and configured to be electrically connected at a first end to respective connectors of said connector device

mounted on said printed circuit board, (Fig. 2B and col. 4, lines 57-67); said signal lines being grouped in a plurality of adjacent corresponding pairs, respective ones of said shields being located on each side of each of said plurality of corresponding pairs of said signal lines; wherein said signal lines are part of a bus system (ground shields are arranged between a pair of signal lines) (Fig. 2B and col. 4, lines 57-67). Robertson teaches shields located on each side of the signal pair (at ground pins), however, Robertson does not explicitly disclose shields that extend adjacent and the length of the signal to the circuit card and supported by the circuit card. AAPA teaches shields that extend the entire length of the signal to the circuit card and supported by the circuit card (Fig. 3 and paragraph [0008-0009]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement shields that extend the entire length of the signal to the circuit card and supported by the circuit card as taught by AAPA in the system of Robertson to reduce cross-talk along the entire signal lines.

As to claims 7, 9, 12, Robertson further teaches said shields are ground shields (ground) (col. 3, lines 62-67).

As to claim 14, Robertson further teaches the connector is adapted for connection to a motherboard (col. 3, lines 47-66 and col. 4, lines 40-59).

As to claim 16, Robertson further teaches each said shield is a ground shield (ground) (col. 3, lines 62-67).

As to claims 19, 26, 30, 33, Robertson teaches a processing system comprising: a processing unit (e.g. CPU 1001); a connector device (102) having a plurality of pins and electrically connected to said processing unit and a circuit card (memory module 100)

coupled to said processing unit through said connector device (col. 5 lines 40-59 and Figs. 4, 5), said circuit card comprising: a circuit element supported by the circuit card and having a plurality of inputs and outputs (Figs. 1A, 1B); a plurality of signal lines (103) supported by the circuit card, each of said plurality of signal lines being coupled respectively between one of said plurality of inputs and one of plurality of pins, or one of said plurality of outputs and one of plurality of pins (ground shields are arranged between a pair of signal lines) (Fig. 2B and col. 4, lines 57-67); a plurality of shields, each shield being connected respectively to said circuit element, said signal lines being grouped in a plurality of adjacent corresponding pairs, a shield being located between respective corresponding pairs of said signal lines (two signal pins 104 are arranged between a pair of ground pins) (Figs. 1A, 1B, 2B and col. 4, lines 57-67, wherein said processing system comprises a bus system for passing signals through said processing system and said signal lines are coupled to said bus system (Figs. 4-5 and col. 5 line 40 to col. 6 line 3As to claim 20, Robertson further teaches the shield is a ground shield (ground) (col. 3, lines 62-67). Robertson teaches shields located on each side of the signal pair (at ground pins), however, Robertson does not explicitly disclose shields that extend the entire length of the signal to the circuit card and supported by the circuit card. AAPA teaches shields that extend the entire length of the signal to the circuit card and supported by the circuit card (Fig. 3 and paragraph [0008-0009]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement shields that extend the entire length of the signal to the circuit card and supported by the circuit card as taught by AAPA in the system of Robertson to reduce cross-talk along the entire signal lines.

As to claim 20, Robertson further teaches each said shield is a ground shield (ground) (col. 3, lines 62-67).

As to claim 24, Robertson further teaches said circuit element is a memory device (col. 4, lines 5-21).

As to claim 27, Robertson further teaches shields are a ground shields (ground) (col. 3, lines 62-67).

As to claim 29, Robertson further teaches a motherboard, equipped with a connector adapted for connection of said memory expansion card to said motherboard, the connector comprising connecting pins corresponding respectively to said signal lines and said shields (col. 3, lines 47-66 and col. 4, lines 40-59).

As to claim 31, Robertson further teaches said shields are a ground shields (ground) (col. 3, lines 62-67).

2. Claims 3 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (6,658,530) (hereinafter Robertson) in view of Applicant's Admitted Prior Art (hereinafter AAPA) and further in view of Chin et al. (6,216,205) (hereinafter Chin).

As to claim 3, the argument above for claim 1 applies. However, Robertson does not explicitly disclose a driver to drive the signals between said inputs and said outputs of said circuit element. Chin teaches driver (I/O driver 16) to drive signals between inputs and outputs of an integrated circuit memory device (col. 8, lines 28-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to

include a driver as taught by Chin in the integrated circuit memory device of Robertson to for transferring data to and from the memory device (col. 8, lines 32-39).

As to claim 22, the argument above for claim 19 applies. However, Robertson does not explicitly disclose a driver to drive the signals between said inputs and said outputs of said circuit element. Chin teaches driver (I/O driver 16) to drive signals between inputs and outputs of an integrated circuit memory device (col. 8, lines 28-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a driver as taught by Chin in the integrated circuit memory device of Robertson to for transferring data to and from the memory device (col. 8, lines 32-39).

3. Claims 4, 10, 13, 17, 23, 28, 32, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (6,658,530) (hereinafter Robertson) in view of Applicant's Admitted Prior Art (hereinafter AAPA), and further in view of Ortega et al. (6,527,587) (herein after Ortega).

As to claim 4, the argument above for claim 1 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 10, the argument above for claim 8 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential

signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 13, the argument above for claim 11 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 17, the argument above for claim 15 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 23, the argument above for claim 19 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 28, the argument above for claim 26 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 32, the argument above for claim 30 applies. However, Robertson does not explicitly disclose the signals in each of said corresponding pairs are differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

As to claim 35, the argument above for claim 33 applies. However, Robertson does not explicitly disclose adapting said first plurality of connectors in each corresponding pair to conduct differential signals. Ortega teaches differential signals (col. 1, lines 49-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement differential signals as taught by Ortega in the system of Robertson to suppress signal noise and/or cross-talk (col. 1, lines 49-52).

4. Claims 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (6,658,530) (hereinafter Robertson) in view of Applicant's Admitted Prior Art (hereinafter AAPA), and further in view of Elabd (6,526,462).

As to claim 25, the argument above for claim 19 applies. However, Robertson does not explicitly disclose the processing unit and the circuit element are on a same chip. Elabd teaches implementing the processor, memory, control unit, etc… on the same chip (col. 1, lines 22-54). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the processor and the integrated circuit on the same chip as taught by Elabd in the system of Robertson to provide a product that is smaller and faster (col. 1, lines 26-31).

(10) Response to Argument

a) Regarding Applicant's argument "***If one of ordinary skill in the art follows the teachings of Robertson, one would not be motivated to follow the teachings of the AAPA to add shields that extend the entire length of the signal to the circuit cards, but would instead be motivated by Robertson to eliminate the shields of the AAPA and simply provide ground connector pins, as Robertson teaches, to eliminate cross-talk. Therefore, there is no motivation or suggestion to combine Robertson with the AAPA. The two methods are simply incompatible***" (pages 12-14 of the Brief):

First, it is noted that Roberson teaches ground shields (ground pin 106) located on each side of every pair of signal lines (signals 103) to reduce cross-talk (Robertson, Fig. 1 and col. 3 line 46 to col. 4 line 4). Roberson does not explicitly disclose the shields which extend from ground pins to the entire length of the signals, but instead discloses shielding only at the pins (106). AAPA discloses shields (shields 60) which extend along the entire length of the signals (signals B0, B1, B2) (AAPA, Fig. 3) and clearly suggests that "***Operating bandwidth*** of the bus B can also be ***improved by reducing the signal***

cross-talk of proximate signals on the bus… One technique that is used ***to reduce signal cross-talk*** is to ***provide ground or reference shield next to each signal line*** on the bus as illustrated in Fig. 3" (AAPA, page 3, paragraph [0008]). Therefore, one of ordinary skill in the art would recognize the benefit of having the shields extending along the entire length of signal lines to reduce cross-talk and improve operating bandwidth of the bus as clearly suggested by AAPA above. Thus, the Examiner disagreed with Applicant's assertion that "there is no motivation or suggestion to combine Robertson with the AAPA".

b) Regarding Applicant's argument "***Robertson teaches away from its combination with the AAPA… Robertson's signal traces are not shielded at all on the card, and Robertson does not suggest that they should be, or need be, shielded on the card***" (pages 15-16 of the Brief):

Since Robertson teaches shields at the pins and AAPA teaches shields at the pins and also extending from the pins to the entire signal lines, and since AAPA clearly suggests the motivation to do so as addressed above, one of ordinary skill in the art would be motivated to extend shielding from the pins (106) of Robertson to the entire length along the signal lines to reduce cross-talk along the entire signal lines, compared to just reduce cross-talk at the pins. Thus, Robertson does not teach away from its combination with AAPA. Therefore, the combination to extend shielding along the entire signal lines as taught by AAPA in the system of Robertson to reduce cross-talk is proper, and Appellant's argument on this point cannot be considered persuasive.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Examiner, Au2111

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